The Massachusetts Bay Transportation Authority Retirement Fund

Actuarial Valuation Report
Prepared as of December 31, 2015

July 2016

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Section I - Overview

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Retirement Board
Massachusetts Bay Transportation Authority Retirement Fund
One Washington Mall, Fourth Floor
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Dear Board Members:

The Pension Agreement covering the Massachusetts Bay Transportation Authority Retirement Fund provides that the actuary make annual actuarial valuations of the Fund and certify rates of contribution to the Retirement Board.

This report presents the results of an actuarial valuation of the Fund, prepared as of December 31, 2015, together with our recommendations regarding the rates of contribution payable beginning July 1, 2016.

This valuation reflects the funding policy adopted by the Board effective December 31, 2009. The actuarial cost method used is the entry age normal cost method. The amortization of the unfunded liability is made in installments increasing at the rate of four percent per year over a closed 30-year period beginning December 31, 2009.

This valuation is based on the assumptions adopted by the Retirement Board, in February 2016, on the basis of an experience study covering the period January 1, 2010, through December 31, 2014. The actuarial assumptions covering termination, disability, retirement, and pre- and post-retirement mortality were changed, and the assumed interest rate used in funding calculations was lowered from 8.00% to 7.75%. All of these changes were effective December 31, 2015. I believe that these assumptions are reasonable.

We performed the valuation using participant data and plan asset data supplied by the Authority and Retirement Fund. Although we did not audit the data, we reviewed the data for reasonableness and consistency with the prior year's information. The accuracy of the results of the valuation are dependent on the accuracy of the data.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. An analysis of the potential range of such future differences is beyond the scope of this report. Where presented, references to "funded ratio" and "unfunded accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Qualification Standards of the Academy to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about it.

BUCK CONSULTANTS, LLC

David L. Driscoll, FSA, FCA, MAAA, EA
Principal, Consulting Actuary

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Section II - Summary of Principal Results

1. The principal results of the current and preceding years' valuations are summarized below:

Valuation Date	December 31, 2014	December 31, 2015
Number of active members	5,798	5,885
Annual compensation of all members	$ 417,957,007	$ 443,237,899
Annual compensation of active members below normal retirement age	$ 415,146,025	$ 440,501,980
Average age	47.55	47.45
Average service	11.44	11.03
Average compensation	$ 72,086	$ 75,317
Number of active members not accumulating creditable service	134	88
Number of retired members, beneficiaries and disabled members	6,407[1]	6,472[2]
Annual retirement allowances	$ 185,827,100	$ 192,715,872
Assets for funding purposes	$ 1,632,174,762	$ 1,630,411,191
Unfunded accrued liability	$ 815,556,295	$ 941,672,817
Contribution rates required:		
Normal	9.1000%	10.0100%
Accrued liability	12.3000%	13.4900%
Expenses	0.4500%	1.0000%
Total required rate	21.8500%	24.5000%
Member excess rate	0.0000%	0.0000%
Actual contribution rate during following fiscal year	21.8500%	24.5000%

2. Valuation results as of December 31, 2015, are given in Section VI, and contribution levels are set forth in Section VII.

3. Schedule B of this report outlines the actuarial assumptions and methods used in the valuation. The actuarial assumptions were selected on the basis of an experience study covering the five-year period ending December 31, 2014. The Board voted to adopt these assumptions in February 2016.

4. Schedule C of this report presents a summary of the main provisions of the Fund, as interpreted in preparing the actuarial valuation.

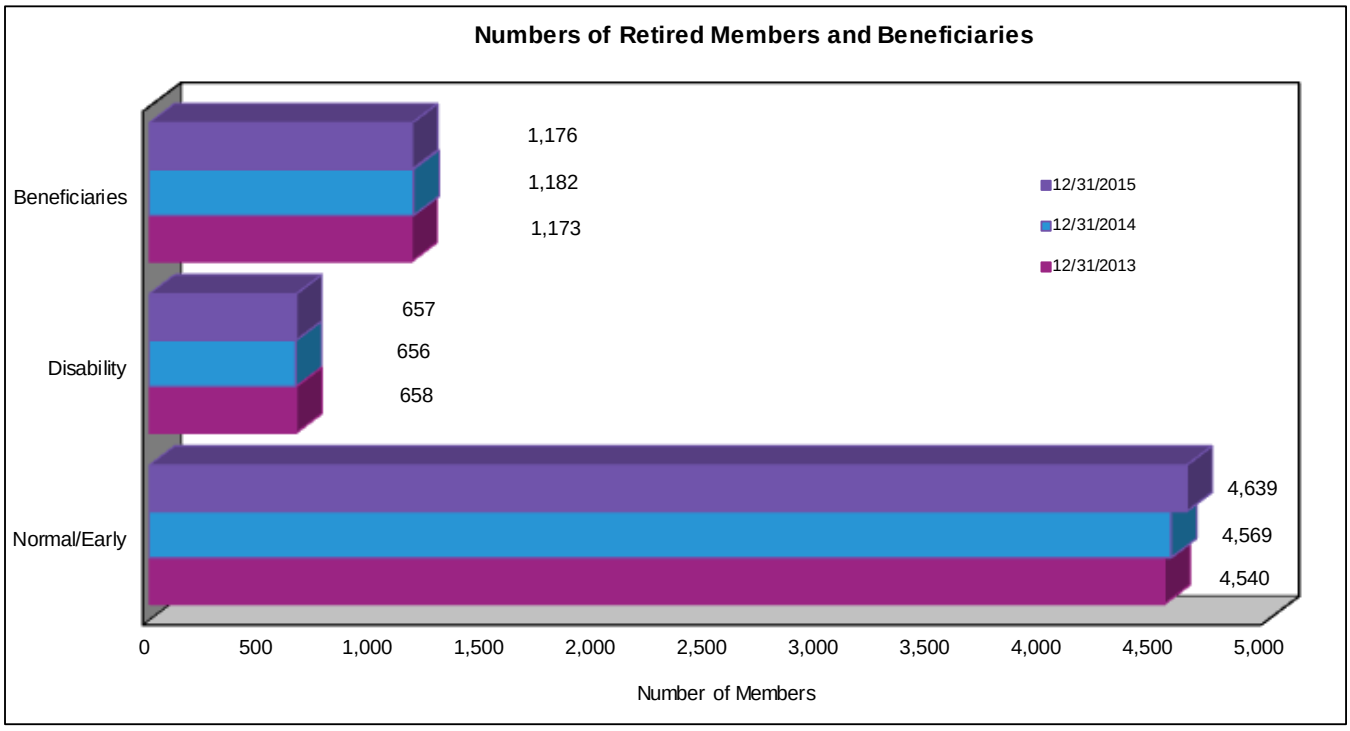
[1] Includes 6,309 retirees and beneficiaries and 98 individuals receiving payments under QDROs.
[2] Includes 6,371 retirees and beneficiaries and 101 individuals receiving payments under QDROs.

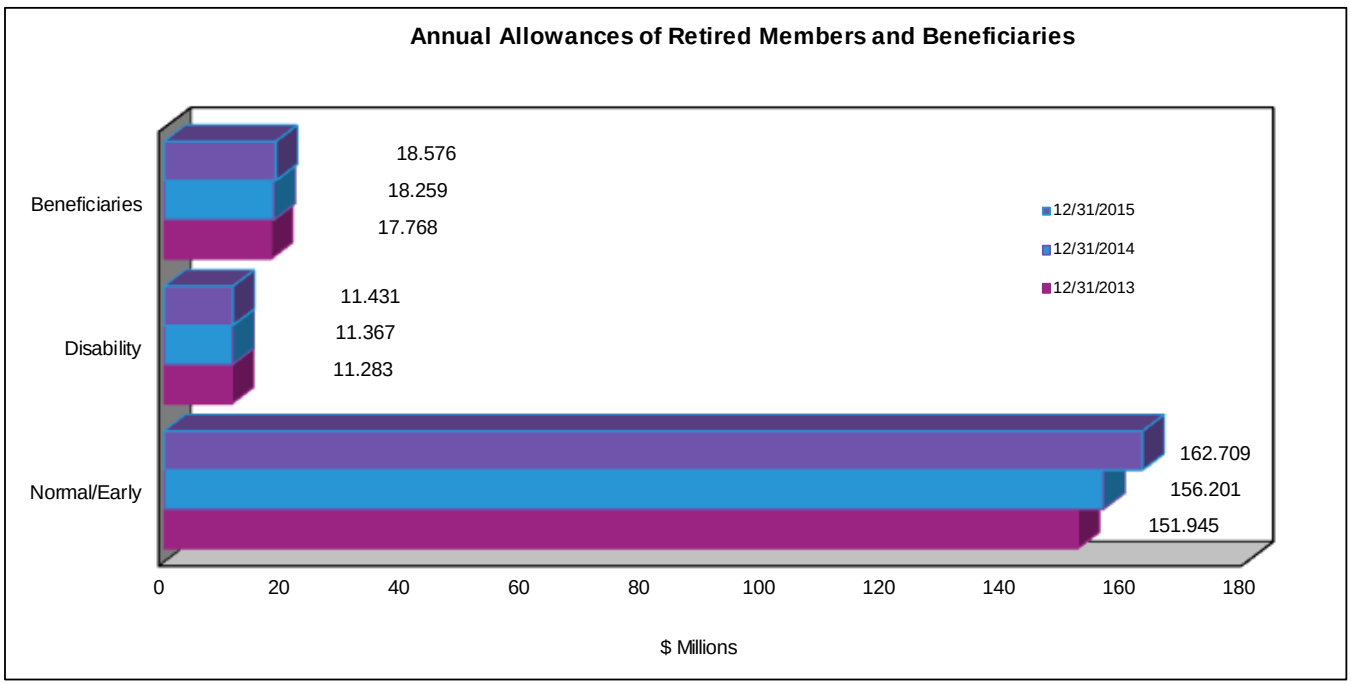
Section III - Membership Data

1. Employee data were furnished by the Authority and Retirement Fund.
2. Table 1 of Schedule D shows the number and annual compensation of active members, while Table 2 of Schedule D shows the number and annual retirement allowances of retired members, disabled members and beneficiaries.
3. The following table summarizes the number and annual retirement allowances of retired members, disabled members and beneficiaries as of December 31, 2015:

Category	Number	Annual Retirement Allowances
Benefits to Members Retired on Normal, Early Normal and Reduced Early Retirement Allowances	4,639	$ 162,709,154
Benefits to Members Retired on Disability Retirement Allowances	657	11,430,918
Benefits to Beneficiaries of Deceased Members	1,176	18,575,800
Total	6,472	$ 192,715,872

Section III - Membership Data (continued)





Section IV - Assets

1. Asset information was obtained from the Retirement Fund office.
2. The market value of the Fund's net assets available for benefits as of December 31, 2015, amounted to $1,497,848,035.
3. The asset method is a five-year phase-in smoothing method under which the value of assets for actuarial purposes equals market value less a five-year phase-in of the differences between actual and assumed investment return. The value of assets for actuarial purposes may not differ from the market value of assets by more than 20%. The smoothing method used to calculate the value of assets for actuarial purposes was restarted as of December 31, 2013, coincident with the change to the present method.
4. The calculation of the actuarial value of assets as of December 31, 2015 is presented below:

Market value as of December 31, 2015					1,497,848,035	(A)
Adjustment to recognize asset gains (losses) over 5 years:						
Year Ending	Asset gain (loss)	X	Adjustment factor	=	Adjustment	
12/31/2015	(124,258,689)		0.80		(99,406,951)	
12/31/2014	(55,260,341)		0.60		(33,156,205)	
Total					(132,563,156)	(B)
Actuarial value of assets as of, December 31, 2015					1,630,411,191	
Asset gain during fiscal year ending December 31, 2015						
Actual return on market value and cash flow						
Income from investments and securities lending					57,393,688	
Net appreciation					(45,625,486)	
Investment expenses					(6,611,956)	
Total					5,156,246	(C)
Expected 8.00% return on market value and cash flow					129,414,935	(D)
Asset gain (loss) (C) – (D)					(124,258,689)	

The assets for valuation purposes are 108.85% of market value.

5. As of December 31, 2007, members' excess contributions (as discussed in Section V) had been fully depleted to cover the cost of the one-time cost-of-living increases negotiated during the collective bargaining related to the benefits provided under the Fund. The actuarial asset value derived above thus requires no additional adjustment for members' excess contributions.

Section V – Member Excess Contributions

1. Effective July 1, 1998, in lieu of a reduction in the 4% contribution rate, members continued to make contributions equal to 4% of covered payroll.

2. To the extent that 4.00% exceeds the actuarially determined member required contribution rate, the excess is characterized as member excess contributions. These amounts are to be accumulated within the Retirement Fund and used to provide additional benefits.

3. The member excess rates developed in prior years are as follows:

Period	Excess Rate	Period	Excess Rate
July 1, 2001 – June 30, 2002	3.53610%	July 1, 2008 – June 30, 2009	0.00000%
July 1, 2002 – June 30, 2003	0.64610%	July 1, 2009 – June 30, 2010	0.00000%
July 1, 2003 – June 30, 2004	0.00000%	July 1, 2010 – June 30, 2011	0.00000%
July 1, 2004 – June 30, 2005	0.27610%	July 1, 2011 – June 30, 2012	0.00000%
July 1, 2005 – June 30, 2006	0.08610%	July 1, 2012 – June 30, 2013	0.00000%
July 1, 2006 – June 30, 2007	0.39610%	July 1, 2013 – June 30, 2014	0.00000%
July 1, 2007 – June 30, 2008	0.39610%	July 1, 2014 – June 30, 2015	0.00000%

4. As of December 31, 2007, members' excess contributions accumulated in prior years had been fully depleted.

5. The member excess rate for the period July 1, 2015 - June 30, 2016 is derived as follows:

   a. Effective prior member excess rate (December 31, 2014) -1.4464%

   b. Decrease in total required contribution rate from prior valuation (see Section VII) -2.6800%

   c. Current member excess rate (July 1, 2015) ((a.) + 25% of (b.)) -2.1164%

6. The accumulated value of the excess contributions as of December 31, 2015 is $0.

Section VI – Comments on Valuation

1. Schedule A of this report presents the results of the valuation as of December 31, 2015.
2. The total entry age normal accrued liability on account of benefits expected to be paid to present retired members, former members, beneficiaries, active and inactive members is $2,572,084,008**.** Of this amount, $1,774,425,407 is on account of retired members and beneficiaries, $795,769,720 is on account of present active members and $1,888,881 is on account of contributions expected to be returned to active members not accumulating creditable service.
3. The value of Fund assets to be used in developing required contributions to the Fund is $1,630,411,191, including required contributions made by active members. When $1,630,411,191 is subtracted from $2,572,084,008, there remains $941,672,817, which represents the unfunded actuarial accrued liability of the Fund.
4. Amortization of the unfunded liability over the remaining 24 years in the amortization period as of December 31, 2015, in annual installments rising at the rate of 4% per year produces an amortization installment of $59,406,600 as of December 31, 2015. This amounts to 13.49% of the value of annual compensation of active members below normal retirement age on that date.
5. The total entry age normal cost at December 31, 2015, is $44,076,861, or 10.01% of the annual compensation of active members below normal retirement age on that date.
6. In addition to the amounts needed to cover amortization of the unfunded liability and normal cost, an allowance of 1.00% of annual compensation of active members below normal retirement age is included in the total required contribution to cover expenses.
7. During 2015, the unfunded actuarial accrued liability increased $126.1 million, from $815.6 million to $941.7 million. The expected unfunded actuarial accrued liability at December 31, 2015, was $817.2 million. The $124.5 million difference consists of a $39.8 million shortfall in 2015 of returns on the actuarial value of assets, $63.3 million in increased accrued liability owing to the changes made to actuarial assumptions effective December 31, 2015, and $21.4 million in increases in accrued liability due to unfavorable demographic experience in 2015. Additional detail is provided in Section IX.

Section VII – Contributions to the Fund

1. Effective December 31, 2009, the contributions by members and the Authority are to provide normal contributions, amortization of the unfunded accrued liability and administrative expenses. It is assumed that investment earnings will be sufficient to cover fiduciary and investment expenses and, in addition, provide the yield assumed for actuarial purposes.

2. The valuation indicates that 10.01% of compensation is required to cover normal cost and 13.49% of compensation is required to cover amortization of the unfunded accrued liability. Adding 1.00% of compensation for anticipated administrative expenses, excluding fiduciary and other investment expenses, results in a total contribution rate of 24.50% of compensation to be paid by the Authority and the members of the Retirement Fund from July 1, 2016, through June 30, 2017.

3. This rate is 2.68% more than the 21.82% rate developed in the December 31, 2014, valuation. Under the adjustment formula contained in the July 1, 2002, Pension Agreement, 75% of the change will be allocated to the Authority as a change in the in contribution rate and 25% will be allocated to the member's required contribution rate. This results in the following rates payable during the year beginning July 1, 2016:

Authority	18.0386%
Members' required	6.4614%
Subtotal (Section II)	24.5000%
Members' excess (Section V)	0.0000%
Total	24.5000%

Section VIII – Statement No. 25 of the Governmental Accounting Standards Board

1. Statement No. 25 of the Governmental Accounting Standards Board has been superseded by Statement No. 67. Required reporting for the Retirement Fund under Statement No. 67 will be covered in a separate report. The information below is shown nonetheless for informational purposes.

2. The following schedule shows funding progress information that would have been required by Statement No. 25 as of December 31, 2015:

Schedule of Funding Progress (,000)

Year Ending December 31	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage Covered Payroll ((b-a)/c)
2015	1,630,411	2,572,084	941,673	63.39%	440,502	213.77%
2014	1,632,175	2,447,731	815,556	66.68%	415,146	196.45%
2013	1,606,684	2,364,133	757,449	67.96%	379,071	199.82%
2012	1,456,957	2,312,170	855,213	63.01%	370,873	230.59%
2011	1,550,446	2,276,750	726,304	68.10%	366,535	198.15%
2010	1,649,129	2,341,344	692,215	70.44%	356,608	194.11%

Section IX – Experience

Records are maintained whereby the actual experience of active and retired members is compared to that expected on the basis of the tables adopted by the Retirement Board. In this way, deviations in the experience from that anticipated will be noted and any adjustments believed necessary will be brought to the attention of the Retirement Board in future experience studies.

During the last year, the total unfunded actuarial accrued liability (UAL) was expected to increase from $815,556,295 to $817,210,556. The actual UAL at the end of the year was $941,672,817. The chart below reconciles the expected to actual UAL. The primary sources of changes were a $63,334,197 increase in the accrued liability resulting from changes made to actuarial assumptions and returns on investments that were $39,755,074 below expected levels in 2015.

The sources of the (Gains)/Losses are as follows:

Actual UAL as of December 31, 2014		$ 815,556,295
Expected UAL (Prior to Changes) as of December 31, 2015		$ 817,210,556
Salary Increases	$ 12,235,361	
New Participants	319,681	
Active – Retirements	7,403,533	
Active – Terminations	7,282,258	
Active – Mortality	553,146	
Active – Disablities	735,548	
Retiree Mortality	(17,485,115)	
Other (Data Corrections, etc.)	10,328,580	
Liability (Gain)/Loss – Demographic Experience		$ 21,372,992
Change in Accrued Liability Due to Assumption Changes		$ 63,334,197
Total of Liability (Gain)/Loss and effects of changes in assumptions and Contribution rates		$ 84,707,189
Investment (Gain)/Loss		$ 39,755,074
Total Change in UAL		$ 124,462,262
Actual UAL as of December 31, 2015		$ 941,672,817

Schedule A – Results of the Valuation as of December 31, 2015

1.	Present Value of Future Benefits	
	(a) Present value of prospective benefits to retired members, former members and beneficiaries	$ 1,774,425,408
	(b) Present value of prospective retirement allowances on account of present active members	1,180,773,204
	(c) Present value of members' contributions to be returned to the members not accumulating creditable service	1,888,881
	(d) Total actuarial liabilities	$ 2,957,087,493
2.	Assets of the Fund for purposes of development of contributions	$ 1,630,411,191
3.	Present value of future contributions to the fund (1(d)-2)	$ 1,326,676,302
4.	Present value of future normal contributions to the Fund[1]	$ 385,003,485
5.	Unfunded accrued liability (3) - (4)	$ 941,672,817

[1] Includes future contributions of members at the rate developed in Section VII.

Schedule B – Outline of Actuarial Assumptions and Methods

Data

For new entrants, the rate of pay was used for the 2015 salary.

Interest rate for funding purposes

7.75% per annum, compounded annually, in addition to fiduciary and investment management expenses.

Separations from active service

Representative values of the assumed rates of withdrawal and reduced early retirement and disability are as follows:

Age	Withdrawal and Reduced Early Retirement	Disability Male[1]	Disability – Female[1]
20	.0878	.0007	.0011
25	.0665	.0008	.0012
30	.0498	.0010	.0015
35	.0373	.0013	.0020
40	.0362	.0017	.0026
45	.0337	.0015	.0038
50	.0338	.0025	.0044
55	.0403	.0046	.0080
60	.0557	.0090	.0158
64	.0691	.0168	.0294

Representative rates of unreduced early normal retirement allowances are as follows:

Hired Before December 6, 2012:

	Males		Females	
Age	In the year attaining 23 years	In years after attainment of 23 years	In the year attaining 23 years	In years after attainment of 23 years
50	15%	4%	15%	4%
55	20%	5%	20%	5%
60	30%	10%	30%	10%
62	35%	10%	35%	10%
63	35%	10%	35%	10%
64	35%	20%	35%	20%
65	35%	30%	35%	30%
66	25%	25%	25%	25%
67	25%	25%	25%	25%
68	25%	25%	25%	25%
69	25%	25%	25%	25%
70	100%	100%	100%	100%

[1] 50% of disabilities are assumed to qualify for occupational disability benefits.

Schedule B – Outline of Actuarial Assumptions and Methods (continued)

Hired After December 6, 2012:

	Males		Females	
Age	In the year attaining 25 years	In years after attainment of 25 years	In the year attaining 25 years	In years after attainment of 25 years
50	0%	0%	0%	0%
55	20%	20%	20%	20%
60	30%	10%	30%	10%
62	35%	10%	35%	10%
63	35%	10%	35%	10%
64	35%	20%	35%	20%
65	35%	30%	35%	30%
66	25%	25%	25%	25%
67	25%	25%	25%	25%
68	25%	25%	25%	25%
69	25%	25%	25%	25%
70	100%	100%	100%	100%

Salary increases

4% per year.

Deaths before and after retirement

The RP-2000 Blue Collar Mortality Tables with generational projection using Scale BB are used for all active participants. 97.2% of the RP-2000 Blue-Collar Tables for Healthy Males projected by Scale BB generationally are used for all retirees and deferred vested participants. 116.5% of the RP-2000 Blue-Collar Tables for Healthy Females projected by Scale BB generationally are used for all beneficiary participants. The RP-2000 Tables for Disabled Lives projected by Scale BB generationally are used for the period after disability retirement. Among pre-retirement deaths, 7.50% are assumed to qualify for accidental death benefits.

Normal retirement

Age 65.

Percent married

90% of male members and 50% of female members under age 55 or who have less than 23 years of service are assumed to be married. 100% of employees age 55 and older or who have 23 or more years of service are assumed to be married. In each case, the female is assumed to be three years younger than the male.

Pension options

50% of male members elect a 75% joint and survivor benefit and 10% of female members elect a 50% joint and survivor benefit. All others elect a life annuity.

Fiduciary and investment management expenses

Paid from investment earnings of the Fund.

Loading or contingency reserves

None.

Schedule B – Outline of Actuarial Assumptions and Methods (continued)

Valuation method

Prior to December 31, 2009, projected benefit method with entry age normal cost and open-end accrued liability. On and after December 31, 2009, individual entry age normal method.

Asset valuation method

A five-year phase-in smoothing method is used, under which the value of assets for actuarial purposes equals market value less a five-year phase-in of the differences between actual and assumed investment return. The value of assets for actuarial purposes may not differ from the market value of assets by more than 20%.

Effective December 31, 2013, the actuarial asset method was changed from a five-year moving average of market values to a five-year phase-in smoothing method, with the smoothing restarted as of December 31, 2013.

Prior to December 31, 2013, a five-year moving average of market values method was used to compute the actuarial value of assets.

Summary of Changes from December 31, 2014 Valuation

An experience study covering the five-year period ending December 31, 2014 was presented to the board on February 5, 2016. Pursuant to the recommendations of this experience study, the following valuation assumptions were updated from the December 31, 2014 valuation:

(a) Active Service Demographic Assumptions

1. Termination and Reduced Early Retirement Rates – changed to 80% of the rates utilized in the December 31, 2014 valuation.
2. Disability Rates – decreased assumed rates of disability at higher ages for both male and female active participants.
3. Mortality Rates – changed mortality table from UP-1994 Male projected to 2020 with Scale AA to the RP-2000 Blue Collar Mortality Tables with generational projection using Scale BB.
4. Service Retirement Rates – adjusted assumed rates of service retirements for males and females in the year in which participants complete sufficient years of service for unreduced benefits as well as for subsequent years of service.

(b) Post-Retirement Mortality Rates

1. Service Retirements – changed mortality table from UP-1994 Male Table projected to 2020 with Scale AA to 97.2% of the RP-2000 Blue-Collar Tables for Healthy Males projected by Scale BB generationally.
2. Dependents of Deceased Members – changed mortality table from UP-1994 Female Table projected to 2020 with Scale AA to 116.5% of the RP-2000 Blue-Collar Tables for Healthy Females projected by Scale BB generationally.
3. Disabled Retirees – changed mortality table to the RP-2000 Tables for Disabled Lives projected by Scale BB generationally.

(c) Economic Assumptions

1. Interest Rate – changed from 8.00% to 7.75%.
2. Expenses – changed from 0.45% of payroll to 1.00% of payroll.

The changes in assumptions discussed above increased the plan's accrued liability by $63.3 million.

Schedule C – Summary of Main Provisions of the Fund as Interpreted for Valuation Purposes

The Massachusetts Bay Transportation Authority Retirement Fund became effective as of January 1, 1948. The following summary describes the current main membership, benefit, and contribution provisions of the Fund as interpreted for the valuation.

1 - Definitions

"Compensation" means the full regular remuneration paid to an employee, excluding any overtime pay. "Service" creditable under the Fund means all service rendered by a member prior to his normal retirement date since he last became a member for which contributions are made by the member and by the Authority. "Union" means Boston Carmen's Union, Local Division 589 of the Amalgamated Transit Union, AFL-CIO.

2 - Membership

Each employee, including employees on a part-time basis, who is or who may become a member of the Union or any union recognized by the Authority for collective bargaining purposes is included in the membership of the Fund. Any employee who is not a member of the Union but who is in a group which was authorized to participate in the Fund is included in the membership.

3 - Benefits

Normal Retirement Allowance

Condition for Allowance

Any member may retire at age 65. A member may remain in service after the stated retirement date.

Amount of Allowance

The normal retirement allowance equals 2.46% of 3-year average annual compensation multiplied by the years of service, such allowance not to exceed 75% of such average annual compensation.

Early Normal Retirement Allowance

Condition for Allowance

Any member hired prior December 6, 2012 and has completed at least 23 years of service may retire on an early normal retirement allowance.

Any member hired on or after December 6, 2012, has attained age 55 and completed at least 25 years of service may retire on an early normal retirement allowance.

Amount of Allowance

The early normal retirement allowance is computed in the same manner as a normal retirement allowance on the basis of the compensation and service to the time of retirement.

Early Reduced Retirement Allowance

Condition for Allowance

A member who has attained age 55 and has completed at least 20 years of service may be retired on an early reduced retirement allowance.

Amount of Allowance

The early reduced retirement allowance is an immediate allowance, commencing at the date of retirement, and is computed in the same manner as a normal retirement allowance on the basis of compensation and service to the time of early retirement, but reduced by ½ of 1% for each month of retirement prior to normal retirement date.

Schedule C – Summary of Main Provisions of the Fund as Interpreted for Valuation Purposes (continued)

Disability Retirement Allowance

Condition for Allowance

Any member who has completed 4 years of service in case of disablement due to an occupational accident or sickness, or who has completed 6 years of service in case of disablement due to any other cause, and who has become totally and permanently incapacitated, mentally or physically, for the further performance of duty may be retired.

Amount of Allowance

Upon disability retirement, a member receives an allowance commencing immediately, which is computed as a normal retirement allowance on the basis of the compensation and service to the time of disability retirement and is not less than 15% of the member's 3-year average annual compensation.

Vested Retirement Allowance

Condition for Allowance

Any member who has completed 10 years of service and who is not eligible for a retirement allowance is eligible for a vested retirement allowance, in lieu of a refund of his contributions with interest, in the event his employment terminates for reasons other than voluntary quit or discharge for cause.

Amount of Allowance

The vested retirement allowance is a deferred allowance commencing on the member's normal retirement date and equal to a percentage, not exceeding 100 percent, of the amount computed as a normal retirement allowance on the basis of the compensation and service to the time of termination; the applicable percentage is 5 percent multiplied by the number of years of creditable service, not in excess of 20, at the time of termination.

Survivor Benefit

Condition for Benefit

Upon the death of a member who has completed 10 years of service and who is survived by a spouse and/or dependent children designated to receive the deceased member's contributions with interest, a benefit may be elected by such survivor in lieu of the payment of the contributions with interest.

Amount of Benefit

If the deceased member had completed at least 10 but fewer than 23 years of service, the survivor's benefit, payable for life, is equal to the amount which would have become payable if the member had retired as of the date of his death and elected a 50% joint and survivor option in effect as of the date of death with the survivor as the designated person under the option. There is no reduction for early commencement.

If the deceased member had completed at least 23 years of service, the survivor's benefit, payable for life, is equal to the amount which would have become payable if the member had retired as of the date of his death and elected a 100% joint and survivor option in effect as of the date of death with the survivor as the designated person under the option. There is no reduction for early commencement.

Accidental Death Benefit

Condition for Benefit

Upon the death of a member in service whose death results solely from an injury or injuries sustained in the performance of duty, and who is survived by a spouse designated to receive the deceased member's contribution with interest, an allowance shall be payable to said spouse.

Schedule C – Summary of Main Provisions of the Fund as Interpreted for Valuation Purposes (continued)

Amount of Benefit

The accidental death benefit, payable for life, is equal to the amount which would have become payable to the member if the member had retired as of the date of his death on a disability retirement allowance. If there should be insufficient creditable service, the surviving spouse receives the minimum allowance available under the disability retirement provision.

Return of Contributions

On Account of Termination of Service

In the event of a member's termination of employment for any reason other than death or retirement, he is paid the amount of his contributions, with interest.

On Account of Death Prior to Retirement

Upon the death of a member or retired member before his retirement allowance has become effective, the amount of his contributions, with interest, is paid to his beneficiary or estate, unless a survivor benefit is payable.

On Account of Death after Retirement

Upon the death of a retired member, or the survivor of a retired member and his designated beneficiary under an optional benefit, any excess of his contributions at retirement, with interest, over the sum of all retirement allowance payments made is paid to the member's beneficiary or to the survivor's estate.

Our valuation does not include return of contributions on account of death after retirement for current retirees due to negligible impact on the Fund's liabilities.

Optional Benefits in Lieu of Regular Benefits

At retirement, or on his normal retirement date if prior thereto, any member may elect to convert his allowance into an optional benefit of equivalent actuarial value permitted by the Rules and Regulations.

Reinstatement of Creditable Service

If a member's service is interrupted by reason of resignation or dismissal, he has the opportunity upon the completion of 3 years of service after he has been rehired to repay to the Fund all amounts he has withdrawn together with an amount equal to their reasonable earnings. Upon such repayment, the member is to be credited with service for the periods before and after the interruption as though they had been a single period of service.

4 - Contributions

Contributions required to provide benefits and meet administrative expenses are made jointly by the Authority and members. The member contribution rate was increased from 5.1489% to 5.4989% effective August 11, 2012, to 5.5589% effective July 1, 2013, to 5.7989% effective July 1, 2014, to 5.7914% effective July 1, 2015, and to 6.4714% effective July 1, 2016. Member contributions are "picked up" by the Authority pursuant to Section 414(h)(2) of the Internal Revenue Code.

Summary of Changes from December 31, 2014 Valuation

None.

Schedule D – Tables of Employee Data (continued)

Table 1 – The Number and Annual Compensation of Active Members Distributed by Fifth Age and Service as of December 31, 2015

Attained Age	Completed Years of Service																			
	0 to 4		5 to 9		10 to 14		15 to 19		20 to 24		25 to 29		30 to 34		35 to 39		40 & up		Total	
	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary
Under 25	24	1,440,259	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	1,440,259
25 to 29	267	16,033,790	86	6,411,555	1	94,727	0	0	0	0	0	0	0	0	0	0	0	0	354	22,540,072
30 to 34	264	16,083,962	203	15,415,208	58	4,522,361	2	170,872	0	0	0	0	0	0	0	0	0	0	527	36,192,403
35 to 39	235	14,879,469	199	15,137,827	127	10,115,752	48	3,848,693	0	0	0	0	0	0	0	0	0	0	609	43,981,741
40 to 44	217	13,817,231	214	16,471,645	145	11,353,629	115	9,127,608	33	2,628,108	2	189,455	0	0	0	0	0	0	726	53,587,674
45 to 49	252	17,424,109	251	19,894,550	186	14,497,405	154	11,920,869	104	8,293,896	41	3,328,037	0	0	0	0	0	0	988	75,358,867
50 to 54	221	16,096,658	247	19,724,338	224	18,044,801	171	13,451,015	139	11,230,364	123	9,986,559	21	1,752,739	0	0	0	0	1146	90,286,473
55 to 59	134	9,693,766	162	13,069,447	181	14,530,793	124	9,584,663	114	9,151,599	109	8,756,196	43	3,514,681	1	79,290	0	0	868	68,380,434
60 to 64	55	4,158,162	87	6,892,243	103	7,989,580	83	6,556,564	76	6,452,942	60	4,781,691	15	1,196,714	9	731,578	1	73,507	489	38,832,981
65 to 69	20	1,648,552	20	1,581,160	24	1,858,790	20	1,530,073	20	1,785,138	10	836,930	5	424,461	2	164,861	4	314,036	125	10,144,000
70 & up	3	234,423	4	395,162	6	537,872	4	299,104	4	375,045	4	316,450	1	67,767	0	0	3	267,174	29	2,492,996
Total	1,692	111,510,380	1,473	114,993,133	1,055	83,545,710	721	56,489,461	490	39,917,091	349	28,195,317	85	6,956,363	12	975,728	8	654,717	5,885	443,237,899

Schedule D – Tables of Employee Data (continued)

Table 2 – The Number and Annual Retirement Allowances Distributed by Age as of December 31, 2015

	Service Retirements		Disabled Members		Beneficiaries	
Age	Number	Amount	Number	Amount	Number	Amount
<50	96	4,299,843	47	806,466	35	425,937
50	48	2,139,330	7	113,180	4	70,073
51	45	2,028,662	9	135,513	8	67,180
52	60	2,676,863	11	214,928	8	131,496
53	58	2,605,531	10	204,495	9	147,646
54	46	1,919,984	11	186,501	7	103,700
55	83	3,599,679	18	352,133	9	206,112
56	80	3,311,820	25	353,762	8	115,335
57	106	4,556,426	25	486,690	11	116,576
58	80	3,375,578	27	557,798	7	157,842
59	108	4,522,445	9	130,815	14	160,924
60	113	4,758,264	27	483,880	24	340,105
61	120	5,118,896	33	608,788	11	176,543
62	135	5,568,034	28	542,713	13	180,284
63	162	6,824,098	25	411,560	22	466,068
64	141	5,620,113	17	338,205	20	316,690
65	174	6,626,916	35	624,851	21	430,452
66	191	7,420,283	35	661,357	19	330,607
67	222	8,229,447	24	468,684	26	501,992
68	231	8,074,350	31	617,109	30	596,007
69	196	6,759,798	20	349,907	35	643,083
70	189	6,284,775	20	434,659	32	577,193
71	214	7,118,750	23	400,874	32	585,335
72	200	6,453,002	29	352,541	42	813,633
73	183	5,871,168	18	302,544	43	735,015
74	153	4,637,635	15	222,661	26	319,030
75	128	3,758,809	16	282,541	39	609,207
76	141	4,321,966	9	107,325	32	545,735
77	110	3,203,724	12	199,880	34	539,667
78	110	3,028,450	6	92,518	35	599,357
79	92	2,639,895	7	66,103	49	842,477
80	85	2,331,369	6	85,711	31	505,279
81	69	1,823,601	3	25,902	30	465,741
82	70	1,815,326	6	88,074	28	413,828
83	72	1,750,818	4	33,127	31	483,077
84	44	1,117,197	0	0	36	526,414
85	43	1,002,497	2	23,843	32	417,547
>85	241	5,513,812	7	63,279	283	3,912,611
Total	4,639	162,709,154	657	11,430,918	1,176	18,575,800
No Option	2,962	104,428,893	531	9,463,290	1,176	18,575,800
Survivor Option	38	1,613,858	9	139,056	0	0
Pop-Up Option	1,639	56,666,403	117	1,828,571	0	0
Total	4,639	162,709,154	657	11,430,918	1,176	18,575,800